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Modeling of non-stationary accretion disks in X-ray novae A 0620-00 and GRS 1124-68 during outburst

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Abstract

Aims. We address the task of modeling soft X-ray and optical light curves of X-ray novae in the high/soft state.Methods. The analytic model of viscous evolution of an externally truncated accretion α-disk is used. Relativistic effects near a Kerr black hole and self-irradiation of an accretion disk are taken into account.Results. The model is applied to the outbursts of X-ray nova Monocerotis 1975 (A 0620-00) and X-ray nova Muscae 1991 (GRS 1124-68). Comparison of observational data with the model yields constraints on the angular momentum (the Kerr parameter) of the black holes in A 0620-00 and GRS 1124-68: 0,3-0,6 and ≤., and on the viscosity parameter α of the disks:0.7-0.95 and 0.55-0.75. We also conclude that the accretion disks should have an effective geometrical thickness 1.5-2 times greater than the theoretical value of the distance between the photometric layers. © 2008 ESO.

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Keywords

Binaries: close, Stars: individual: Nova Mon 1975, Stars: individual: Nova Mus 1991, X-rays: binaries